Pest's Peptides Could Cramp Its Style

Peptides, compounds that may play important roles in controlling feeding and reproduction, have been detected in extracts from an important soybean pest. Soybean growers currently use resistant varieties and crop rotation to battle their greatest foe, the soybean cyst nematode. This microscopic, wormlike parasite costs growers about $1.5 billion annually. But resistant varieties are not effective against all races of the nematode and usually yield less than susceptible varieties do when nematodes are absent.

The discovery of these peptides in parasite extracts opens a new path for scientists who are investigating naturally based controls for soybean cyst nematodes. The key may be the peptides' potential involvement in regulating nerve transmission and muscle activity in these pests, as well as their feeding and movement. At least three different peptides have been observed in the nematodes grown on soybean plants. The peptides in soybean cyst nematodes differ from those in nonparasitic species, and their levels vary during the worms' development. Researchers are focusing on those which would be most active in female nematodes, since they will lay the eggs that yield new generations of hungry, root-eating offspring. *Edward P. Masler, USDA-ARS Nematology Laboratory, Beltsville, Maryland; (301) 504-8732, e-mail maslere@ba.ars.usda.gov.*

Vetch-a-Matic Beetle Control

A recent study showed that an organic mulch made from a cover crop of hairy vetch can reduce Colorado potato beetle damage. This notorious pest ravages potato, eggplant, and tomato crops, causing annual crop losses and insecticide-related expenses. Many growers are using imadacloprid, a new systemic insecticide that provides excellent control. But the pest also has a proclivity for developing resistance to insecticides, so there is concern that appropriate measures be taken to prevent that. A nonchemical control such as hairy vetch mulch could be a useful part of a sustainable integrated pest management strategy for Colorado potato beetles.

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Damage from Colorado potato beetles can be reduced by planting tomato seedlings into a mulch residue of hairy vetch.

In the study, hairy vetch was planted in the fall; then the vetch was mowed and killed in the spring before tomatoes were transplanted into it. The vetch impeded the beetles' movement and, since it is a legume, added nitrogen to the soil. Fewer beetles infested tomatoes transplanted into the mulch, compared to tomatoes transplanted into black plastic mulch. And yields of staked, fresh-market tomatoes grown in the mulch were comparable to yields from insecticide-treated fields. *Kevin Thorpe, USDA-ARS Insect Biocontrol Laboratory, Beltsville, Maryland; phone (301) 504-5139, e-mail thorpe@asrr.arsusda.gov.*

For Better Surface Water Quality, Dig Ditches

Drainage ditches are a common feature in the agricultural landscape. They carry runoff water from fields after heavy rains. Now a first-of-its-kind study that looked at the transport and fate of two pesticides in vegetated agricultural drainage ditches suggests they're valuable tools for reducing the amount of chemicals that enter bodies of water. Researchers simulated storm runoff events in order to evaluate the role of edge-of-field best management practices in preventing potential contaminants from leaving agricultural lands.

The researchers attempted to pinpoint the test ditch's efficacy in keeping irrigation water and pesticides from getting into water bodies. They found that it trapped 60 to 90 percent of the herbicide atrazine and a commonly used insecticide Karate carried in runoff water. Its vegetation enabled it to work like wetlands to sequester storm runoff materials. Thus, ditches appear to be a simple, low-tech, inexpensive way to improve surface water quality. Farmers and conservationists who want to reduce the chemicals, nutrients, and sediment leaving their fields may find maintaining ditches a practical and effective alternative management practice. *Matt Moore, USDA-ARS National Sedimentation Laboratory, Oxford, Mississippi; phone (601) 232-2955, e-mail moore@sedlab.olemiss.edu.*

Better Retting for a Fledgling Flax Industry

A new retting process could revolutionize linen fabric production in the United States. Enzymatic retting uses a chemical to break down calcium bonds in the flax plant, allowing easier loosening of flax fiber so it can be extracted from the plant and processed into linen. Researchers have an agreement with the Center for American Flax Fiber to evaluate the process. They will also establish standards for fiber strength, length, fineness, nonfiber content, and color.

North America is the largest producer of flaxseed and related products that yield millions of tons of fiber. But only a fraction of it is used for industrial purposes. The nation now imports about $150 million of flax fiber, flax fabric, and flax-containing yarn annually—which are converted into about $500 million in finished products. Scientists hope enzymatic retting will help establish a domestic flax fiber industry. *Danny E. Akin, USDA-ARS Richard B. Russell Research Center, Athens, Georgia; phone (706) 546-3482, e-mail deakin@qaru.ars.usda.gov.*